

## Abstracts – 9<sup>th</sup> Atrial Fibrillation Symposium 2010, Berlin, Germany

*Several hundred cardiologists and electrophysiologists converged in Berlin for the 9th Atrial Fibrillation Symposium sponsored by the AFib Alliance<sup>SM</sup> Program for what has now become the foremost meeting in Europe on atrial fibrillation and catheter ablation. The scientific faculty, composed of Drs Karl-Heinz Kuck, Carlo Pappone and Michel Haïssaguerre, updated the format of the meeting this year to provide more room for open discussion and understanding current practices of electrophysiologists. The first day of the meeting began with a provocative sequence of presentations with the goal of answering a series of questions starting with 'What are we doing about...?'*

### What are we doing about ... reducing x-ray time?

This session began with the first of a number of audience polls. When asked if they were concerned about x-ray exposure, 74% of the audience responded that they were concerned about x-rays for both themselves and the patient. Concerning the average x-ray time used during catheter ablation of AFib, 36% said between 15-30 min, while 34% responded between 30-45 min. Marco Scaglione (Asti, Italy) began his presentation by commenting that a typical catheter ablation procedure for AFib exposes the patient to an equivalent of >1000 chest x-rays. Moreover, exposition is also high for electrophysiologists, nurses and technicians. Such a high level of exposure has the potential to increase the risk of cancer from somatic DNA changes. The question then arises as to how exposure to ionising radiation can be minimised. Possible solutions include the use of 3D-electroanatomic mapping coupled with image integration. While most operators use CT for image integration, he pointed out that a chest CT was the equivalent of around 400 chest x-rays, which would then be added to the exposure from fluorography. In this regard, he commented that Magnetic resonance imaging (MRI) may be a good first choice for image integration as it limits radiation exposure. The new Carto<sup>®</sup> 3 System is

another imaging tool that may help to reduce radiation exposure, and allows for precise anatomical reconstruction. Another interesting feature of the system is the ability to visualise all catheters, which helps to eliminate fluorographic time during the ablation procedure. He presented preliminary results of an unpublished study performed in his lab in which patients were divided into 3 groups depending on the imaging system used: fluorography (n=40), CartoMerge<sup>®</sup> Module (n=40) and Carto<sup>®</sup> 3 System (n=40). Total fluoroscopy time was found to be 18 min in the fluorography group, 10 min in the CartoMerge<sup>®</sup> Module group and only 2.5 min in the Carto<sup>®</sup> 3 System group. While the total procedural time was the same across all groups, the fluoroscopic time used during the ablation was 7.5 min in the CartoMerge<sup>®</sup> Module group compared to 21 seconds in those ablated using Carto<sup>®</sup> 3 System. In his opinion, remote ablation systems were 'still not convincing', and the Carto<sup>®</sup> 3 System has a number of advantages over robot and magnetic navigation systems including reduced patient exposition to radiation and potential benefits in terms of costs for the healthcare system. While more studies are needed, reduction of fluoroscopic imaging time is an important issue in catheter ablation of AFib, and electrophysiologists need to share both awareness and training in this regard.

In audience polls after the presentation, 90% said that they had reduced the x-ray time with greater experience. Indeed, one-half of those polled said that 'my own increased experience' was the most influential tool in reducing x-ray time, while only 21% cited image integration as being the most influential tool in reducing x-ray time. Concerning barriers to reducing x-ray time, 40% cited lack of experience, while 25% said their own spatial perception ability was the biggest barrier. During the discussion, Prof. Kuck commented that 'imaging doesn't add too much'. He noted there is growing consensus that one of the main factors for successful catheter ablation of AFib is the use of a 3D mapping system, together with adequate training and experience.

### **What are we doing about ... challenges in atrial anatomy?**

A poll of participants before the session showed that the vast majority of ablators are already using some sort of mapping system: 39% reported using 3D mapping by electroanatomical mapping, while 35% reported using image integration with CT/MR. Interestingly, among those not using mapping procedures, 27% cited cost issues and 24% said that it has not been shown to improve ablation success or outcome.

Hein Heidbüchel (Leuven, Belgium) listed the major challenges in improving mapping procedures and visualisation of atrial anatomy during catheter ablation for AFib. These included highly accurate anatomy, perfectly registered to real-time imaging, low or no radiation dose, no increase in procedural time, easy logistics and technical set-up as well as a low added cost. In his opinion, 'perfect anatomy is the first element' for mapping, and noted that all merger approaches have major struggle. For rotational angiography, he is working on a protocol that will reduce the radiation dose by reducing the number of frames per second and using pulsed fluorog-

raphy. Together, such approaches can lead to a reduction in radiation exposure times and provide a good resolution of anatomy that is required for successful ablation.

### **What are we doing about ... improving mapping strategies?**

Richard Schilling (London, UK) spoke of the need to improve mapping strategies, saying that the most obvious reason to do so is to improve results of the ablation. Indeed, in paroxysmal AFib the redo rate is around 40% with successful ablation in 95% of cases, and in persistent AFib a redo procedure is needed in about one-half of patients, with procedural success rates around 80%. In addition, excess and/or erroneous ablation may be common and lead to unnecessary complications and atrial damage. He also noted in this regard that the vast majority of complications are related to the ablation itself. Reviewing current techniques, he commented that while mapping ablation of paroxysmal AFib by voltage mapping and wide encircling lesions was inexpensive, simple and quick. Circular mapping catheters also have several advantages in PV isolation, and can provide a good endpoint. The key criteria for circular mapping catheters include smooth electrodes, deflectable through 270°, have a variable loop size and contain less than 10 but no more than 20 electrodes. Considering the controversial ablation of Complex fractionated atrial electrogram (CFAEs), he noted that there has not been reproducibility in terms of outcomes. Some of these discrepancies may lie in the differences in definitions of CFAEs. However, until it is clearly established what CFAEs are, the controversies are likely to remain. Some of the newer tools that may help to provide new answers to old questions are high-density mapping and the Carto<sup>®</sup> 3 System. In the future, he envisages non-contact, high-resolution visualisation in the near-field range and beat-to-beat characterisation of wavefront propagation. He also stated that focused le-

sion sets, guided by mapping, are still critical to improving outcomes and that many operators are 'still burning more than is needed in many patients'. Lastly, some of the critical burns are not transmural.

In the ensuing audience poll, when asked if rotational angiography would be helpful in their lab, 62% responded yes while 38% thought it would not be of value. When asked how often image integration with CT/MR was used, interestingly 42% responded from 0-25% of cases, and 40% responded in 75-100% of cases; 8% used the technique in 25-50% of patients and 10% said they used image integration in 50-75% of cases. Concerning the optimal mapping time for the LA in paroxysmal AFib, 18.5% answered <3 min, 20.4% <6 min and 32.1% <10 min, whilst 29% said that mapping time was not important.

### **What are we doing about ... shortening procedural time?**

As an example of the importance of procedural time, a poll before the session indicated that 92% of ablators believe that procedural time is an issue. Indeed, 73% reported an average procedural time for ablation of paroxysmal AFib longer than 2 hours (38%, 2-2.5 hours; 35%, >2.5 hours); only 9% reported a procedural time from 1-1.5 hours compared to 18% from 1.5-2 hours. However, 81% said that their procedural times had decreased over the years.

Gabriele Vicedomini (Cotignola, Italy) began his presentation with the realisation that procedural times may be important, but that shorter times do not always correlate with good efficacy. In his centre, he said that in fact procedural times had increased somewhat over the past year, even though largely due to an increase in investigative procedures. In his opinion, ablation should be considered as the cure for AFib as it is clearly superior to drugs and is also associated with lasting efficacy. However, its high costs and

long procedural times limit access to the procedure. He further noted that longer procedural times are associated with a higher rate of complications, and are not well tolerated without deep sedation or full anaesthesia. Nonetheless, over time the complication rate has gone down, while the overall success rate has increased.

### **Callout quote: 'To reduce your procedural time increase your experience' Gabriele Vicedomini**

He further reiterated the importance of experience, both for the operator and for the team in the electrophysiology lab. For catheter ablation of AFib, his group always has 2 electrophysiologists, 1 biomedical engineer, 1 anaesthesiologist, 1-2 nurses and 1 radiology technician. He believes that such a coordinated group is useful for the safety of the procedure and 'allows the operator to concentrate on the ablation'. He also realises that such an approach is only feasible in high-volume centres, and by doing so posed the question of whether or not AFib ablation should be performed only in high-volume centres. He concurred with such an idea saying that the 'more you do the better you are'. As further evidence for this premise, according to literature data, outcomes are much better in high-volume centres. Furthermore, pre-shaped multipolar catheters or balloon catheters cannot be considered a short cut for experience. He is of the opinion that greater implementation of teamwork is needed to decrease procedural time, and that whatever ablation is not necessary should not be done.

In the poll following the presentation, 39% cited an increased incidence of complex AFib ablations as the biggest barrier to improving procedural times; 31% admitted that individual experience of the operator was the biggest barrier. Interestingly, the audience was equally split when asked the question of

whether or not they had a dedicated AFib ablation staff (51%, yes; 49%, no). Lastly, 83% thought that better understanding of the pathophysiology of AFib was 'what was really needed', while only 17% thought that better technologies were what was needed.

### **What are we doing about ... improving ablation strategies?**

Mélèze Hocini (Bordeaux, France) discussed ways of improving ablation strategies, stating that there are still many unresolved issues, such as the targets for ablation, endpoints and ablation in the presence of certain comorbidities such as heart failure. While Pulmonary vein (PV) isolation may be sufficient for the vast majority of patients, all approaches are associated with similar potential risks. Therefore, there is a need for better imaging techniques as fluoroscopic-guided ablation is insufficient for more complex ablation procedures. In this regard, 3D reconstructed anatomy may be valuable. In terms of strategies not targeting the PVs, she noted that CFAE ablation and ablation of Ganglionic Plexi (GPs), while controversial, is nonetheless feasible and safe. One important aspect is reducing the recurrences of paroxysmal AFib related to PV-LA reconnection. In fact, she noted that most recurrences were not associated with duration of AFib, LA size, hypertension, presence of LA scarring or non-PV triggers. However, at least in experienced centres the success rates are generally over 85% in paroxysmal AFib; ablation of long-standing AFib requires a more extensive procedure and is associated with poorer success rates. To obtain improved outcomes, she noted that the following will be needed: use of a combination of techniques, identification of critical targets, more accurate mapping and ensuring completeness of ablation lines. Ablation procedures could be improved upon by better understanding of complex atrial electrograms, better definition of ablation endpoints, development of more effective tools (especially for

the creation of linear lesions), validation of transmural lesions and increasing the efficacy of ablation of long-standing AFib.

In the following participant poll, when asked what approach was used for ablation of paroxysmal AFib as a primary procedure, 68% responded circumferential PV isolation plus confirmation with a circular mapping catheter. Only 12% said that they used circumferential PV isolation alone as a primary procedure for paroxysmal AFib. When asked, what is your primary procedure for persistent/permanent AFib<sup>SM</sup> one-half responded that they used a stepwise approach consisting of circumferential PV ablation plus validation plus CFAE and creation of roof/mitral lines. The 3 most important considerations for ablation of AFib were considered to be: improve ablation effectiveness (87%), improve ablation safety (30%) and reducing the total procedure time (29%).

### **What are we doing about ... improving success rates?**

In considering how to improve success rates of catheter ablation of AFib, Vivek Reddy (New York, USA) noted that in randomised clinical studies versus anti-arrhythmic drugs (AADs), catheter ablation has consistently shown better outcomes. However, with time, especially as more long-term data is becoming available, recurrences tend to occur with time even up to 5 years after the primary ablation procedure. Imaging techniques may vary, but the operator should use whatever he/she is more comfortable with.

**Callout quote:**  
**‘Whatever works for you is what you should do [in terms of imaging]’**  
**Vivek Reddy**

He also described the results of a pilot study<sup>1</sup> investigating the relationship between loss of pace capture directly along the ablation line and electrogram criteria for PV isolation. It was found that complete loss of pace capture directly along the circumferential ablation line correlates with entrance block in 95% of vein pairs and can be achieved without circular mapping catheter guidance. Thus, pace capture along the ablation line can be used to identify conduction gaps. He also mentioned that in his opinion the development of catheter contact sensing strategies should aid in improving success rates as it would be easier to make more reproducible and consistent lesions. Other technologies such as direct visualisation of ablation lesions *in vivo* are still in the early stages of development. One of the potentially most influential factors in improving success rates might be to ablate earlier in the disease course, leading to better long-term outcomes. Similar to others, he acknowledged that better understanding of complex electrograms is needed.

The audience was then polled on their success rates in ablation of paroxysmal and persistent/permanent AFib (see Table). Regarding major complication rates (death, tam-

ponade, PV stenosis) among ablators, 52% reported that their major complication rate was below 1%, and 41% said that it was between 1-5%. Of those polled, 6% reported a major complication rate greater than 5%.

Concerning barriers to improve success rates, the audience poll indicated that 35% claimed the technology in achieving point-to-point ablation was the biggest barrier, while 33% responded that it was the complexity of the patients treated.

**What are we doing about ... improving ablation validation?**

A poll at the beginning of this session indicated that there was large consensus in endpoints for PV isolation, with 92% of respondents stating that elimination of PV signals terminates the procedure for them. Nassir Marrouche (Salt Lake City, USA) presented his interesting results on the use of delayed-enhancement MRI (DE-MRI) to quantify fibrosis and to stage AFib. He also showed how pre-existing LA scarring, determined by the extent of fibrosis, may correlate with procedural outcomes. Based on his new staging system, he has also developed a management protocol. In stages Utah 1 and 2 – for those with the least fibrosis – PV isolation is used, and discontinuation of anticoagulation may be considered. In stage Utah 3, PV isolation

*Reported success rates at 1 year after catheter ablation*

| <b>Success rate</b> | <b>Paroxysmal</b> | <b>Persistent/permanent</b> |
|---------------------|-------------------|-----------------------------|
| 80-100%             | 11.5%             | 5.6%                        |
| 60-80%              | 53.3%             | 26.1%                       |
| 40-60%              | 28.5%             | 50%                         |
| <40%                | 6.7%              | 18.3%                       |

<sup>1</sup> Steven D, et al. 2010. Loss of pace capture on the ablation line: a new marker for complete radiofrequency lesions to achieve pulmonary vein isolation. *Heart Rhythm*. Vol 7 (3); 323-330.

is used along with more extensive ablation, and the patient is maintained on anticoagulants. Finally, in stage Utah 4 – those with most extensive fibrosis – ablation is not considered as a therapeutic option as it will not be effective, and the patient is managed through rate/rhythm control and anticoagulants. A large clinical trial is also in progress to stage AFib and predict outcomes before an ablation procedure. His group has also used DE-MRI to visualise atrial scarring following ablation in an animal model, which is helping to define permanent lesion formation. His data suggests that the absence of voltage in voltage maps does not necessarily mean transmural scarring. Taken together, DE-MRI is an excellent tool with which to measure atrial fibrosis and has also provided a novel means of classification for AFib.

When participants were queried on what they use in order to improve the results of AFib ablation, 52% responded that they pre-select patients; 19% said that they use all available techniques, and 18% said that they pre-define their ablation strategy. Only 11% responded that they pace to validate the ablation.

### **My point of view on catheter ablation of AFib**

In this interesting and novel session, the perspectives of the referring cardiologist and the patient with AFib were presented. Firstly, however, the audience was polled to get an idea of current perceptions among electrophysiologists. Overwhelming consensus was seen when asked if they thought that good contact with the referring physician is important, with 92% responding positively; the vast majority (75%) of electrophysiologists had more than 6 referring physicians. When asked if they thought that enough time was available to discuss AFib treatment options with your patient, participants were evenly divided, with 47% responding yes and 52% responding no. Most believed that greater

awareness is needed for referring physicians (89%), whilst 65% said that they think there should be more lay publicity around AFib ablation to increase awareness. Lastly, only slightly more than one-half claimed to receive feedback from their referring physician on the patient perspective after AFib ablation (54%).

Lars Hennig (Berlin, Germany) is a cardiologist who typically refers patients for AFib ablation. He firstly posed the question of what the patient with AFib is looking for in terms of treatment, to which he answered 'it depends on the level of discomfort'. He noted that up to one-third of AFib patients are asymptomatic, and that even when symptomatic a wide range of symptoms may be present including severe palpitations and panic. It should also be remembered that the patient has 'no chance to avoid symptoms' and they want to know more about the disease, for which they often turn to internet sources. What most patients desire is the absence of symptoms, to avoid anticoagulation and AADs, and to have a normal life expectancy. He commented that electrophysiologists need to provide clear and simple answers for their patients as they are afraid of the procedure and will ask many questions about it and the post-interventional period. As far as the expectations of the referring cardiologist are concerned it should be considered that they must satisfy the wishes of the patient and assure the high quality of the ablation procedure. Electrophysiologists should also take patient fear seriously and sedate as needed. In his opinion, many of these expectations are being met. On a positive note, the success rate is doubled for catheter ablation compared to drugs, and he recommends ablation to all his patients who have problems with drugs. However, for discontinuation of anticoagulation and improvements in life expectancy more trials are needed. Interestingly, he said that he would send more patients for ablation if the patient was satisfied with the treatment and its expectations, even if the procedure was unsuccessful. Contrarily, if the patient complained about treatment, even if successful, he would not send more patients.

**Callout quote:  
'Referring cardiologists don't  
like complaints from their  
patients'**

**Lars Hennig**

While he didn't feel that there was a need to increase the number of electrophysiology labs, at least in Germany, he did comment that there was a need to increase the quality of existing labs. Lastly, medical companies also need to develop new tools to help explain ablation procedures more easily to patients.

Joachim Mohr (Hamburg, Germany) presented his views on AFib from the patient's side. He has undergone more than 30 cardioversions and 4 ablation procedures, and is still in AFib. From his perspective, AFib makes him weak, and he's afraid as he knows about the increased risk of stroke and decreased life expectancy. It reduces his quality of life, and he wants to rid himself of it.

**Callout quote:  
'It is a terrible feeling [being in  
AFib]'**

**Joachim Mohr**

As an informed patient, he gets his information from a variety of sources including the referring cardiologist, the internet and other AFib patients. In this regard, he cautioned electrophysiologists not to "underestimate the internet presence for yourself and your lab". Internet forums may also have significant influence on patients. In preparing patients for the procedure, they need a clear explanation of what they will undergo in simple language, and realistic expectations about outcomes, including the fact that a second procedure may be needed. Lastly, patients al-

so desire information about what to do if the AFib returns.

**Follow-up**

To start off the session on follow-up, Gerhard Hindriks (Leipzig, Germany) attempted to answer the somewhat controversial question of what is considered success after catheter ablation of AFib. According to the latest consensus statement from the HRS/EHRA/ECAS, success should be considered as being off AADs with no episodes of AFib or atrial tachycardia. In terms of recurrence, he noted that the strongest predictor of late recurrence was early recurrence. However, there is still controversy in terms of strategies that should be used to monitor the patient during follow-up, although it is nonetheless clear that more intensive monitoring is associated with more detection of AFib. Currently, continuous ECG monitoring is the gold standard, but not widely available. To address this issue, studies are in progress to document as much AFib as possible during long-term follow-up, which will allow for establishment of a solid basis to better understand the long-term efficacy of ablation, the true impact of asymptomatic AFib, clinical relevance of AFib recurrence and define anticoagulation strategies. In this regard, the XPECT study<sup>2</sup> compared intracardiac monitoring to Holter monitoring. In considering the former system, he mentioned that one limitation of the intracardiac monitor, however, is that although it has a high sensitivity in detecting episodes of AFib, it is not good at detecting short episodes. In addition, another key problem is that the device only stores ECG data for 30 episodes that allow for full manual verification: in some cases though, there may be more than 100 episodes detected, thus questioning the validity of the detected episodes. Lastly, all the

<sup>2</sup> Hindricks G, et al. 2010. Performance of a new Leadless Implantable Cardiac Monitor in Detecting and Quantifying Atrial Fibrillation – Results of the XPECT Trial. *Circ Arrhythm Electrophys.* 3; 141-147.

currently available data suggest that there is a need to establish clear follow-up standards and increase patient awareness.

Christian De Chillou (Nancy, France) overviewed current strategies for follow-up of patients following catheter ablation of AFib with emphasis on complications. Cardiac tamponade occurs in 1-2% of patients undergoing ablation, and is due most often to popping or direct mechanical trauma. Recent case studies suggest that it may also occur after intervention. Regarding thromboembolic events, he discussed the possibility of using heparin as a bridge during the procedure. While the possibility of discontinuing warfarin after the procedure has been discussed, at present discontinuation of warfarin in patients with a CHADS2 score >2 is not generally recommended; warfarin should be continued for at least 2 months following catheter ablation in all patients. Notwithstanding, there is limited data on the frequency of thromboembolic events post-ablation. However, one preliminary study has revealed asymptomatic stroke by MRI in 10% of patients (2/20)<sup>3</sup>. Concerning PV stenosis, there is a definite need for better follow-up instruction for both patients and physicians. PV stenosis is best detected by CT or MRI, although its optimal management is still unclear. Another potential complication is phrenic nerve injury, which is reported to be particularly high with balloon-based catheters and relatively infrequent with Radiofrequency (RF) energy sources. Atrio-oesophageal fistula, even though thankfully rare and potentially fatal, must be recognised and treated quickly. Symptoms include fever, chills and septic shock. It is best diagnosed by contrast CT. In terms of assessing the success of the ablation procedure, there is a clear need for a blanking period, and therefore minimal monitoring may be performed for the first 3 months. As already stated by others, with more intensive monitoring, there is an in-

creased probability of detecting episodes of AFib. He believes that it is possible to define success in terms of ‘electrical success’, with no detectable recurrence of AFib, and ‘clinical success’, in the absence of clinical symptoms. Indeed, the addition of an AAD following ablation may now be an acceptable clinical endpoint. It was also mentioned that withdrawal of oral anticoagulation should be considered very carefully. Lastly, electrophysiologists need to change practice by properly applying current and updated guidelines.

**Callout quote:**  
**‘The desire to stop anticoagulants is not an indication for ablation’**  
*Christian De Chillou*

The participants were then polled as to current management practices. Firstly, they were asked what follow-up tools they used. Not unsurprisingly, 85% said that they used standard ECG, and 71% used 24-hour Holter monitoring; 28% used 7-day Holter monitoring, 21% an implantable device and 19% transtelephonic monitoring. In this regard, Prof. Kuck noted that there was no evidence for use of these implantable devices, in addition to having a high cost and extra intervention for the patient. There is, therefore, no need for these devices in routine clinical practice. He also stated that he did not see the need to distinguish clinical and electrical success as the need for anticoagulation depends on the CHADS2 score. Dr De Chillou countered however, reiterating that ‘clinical success is an excellent endpoint’.

Most participants follow the HRS consensus document for anticoagulation after ablation for AFib (75% ‘yes’, 10% ‘no’, 15% ‘unaware of consensus document’). When asked

<sup>3</sup> Lickfett L, et al. Cerebral Diffusion-Weighted Magnetic Resonance Imaging: A tool to Monitor the Thrombogenicity of Left Atrial Catheter Ablation. J Cardiovasc Electrophys. Vol 17; 1-7.



if they stopped anticoagulation in patients with a CHADS<sub>2</sub> score >1, 47% responded that they never stop anticoagulation, while 39% and 19% stop anticoagulation in the absence of recurrences after 6 months and 1 year, respectively. Almost 70% of participants said they believe in a blanking period. Concerning the cessation of AADs after successful ablation for paroxysmal AFib, 69% responded that they stop after 3 months, and 18% after 6-12 months; 12% stop AADs immediately after the ablation, while only 1% never stop AADs. Relatively few participants believed that dronedarone, dabigatran or occluders would reduce the number of ablation procedures, with 76% responding that none would reduce the number of procedures.

### **Debate: We have all we need to successfully treat AFib**

In this lively debate, Tamas Szili-Torok (Rotterdam, The Netherlands) took the pro stance, arguing that 'We have all we need to successfully treat AFib'. He started off by saying that while the reported success rates for catheter ablation of AFib vary from centre to centre and according to the type of AFib, success rates were good overall. Indeed, more centres are now performing ablation on persistent and permanent AFib, and inclusion criteria such as LA size are less stringent. Considering this, we are already doing well, even if better tools might help to increase the success rates. However, the side effects of imaging like increased radiation dose, use of contrast media and costs may give a false sense of safety and should be more balanced. He further clarified that we already have everything we need to treat AFib, but that we need to have better protocols in place on how to use the available tools to improve the efficacy and safety of ablation.

### **Callout quote: 'We already treat AFib successfully' Tamas Szili-Torok**

In considering manual vs robotic approaches to ablation, he said that he sees no major differences between the two in efficacy, but large differences in the rate of complications, which are less frequent using a robotic approach providing there is the possibility to treat safely. Better ablation lesions could also give better outcomes, although electroanatomic mapping gives no substantial advantages in terms of efficacy outcomes. He believes that more basic research is needed on the pathophysiology of AFib, and that all the technology we need is already available.

Arguing that we don't have everything we need to successfully treat AFib, Sébastien Knecht (Brussels, Belgium) began by pointing out that the perfect therapy would have 100% efficacy and 0% complications, at an acceptable cost. He claimed that catheter ablation for AFib is 'almost' the perfect therapy, and is certainly well-suited for young patients with clear focal triggers. However, the majority of patients are more complex, and the efficacy of the procedure is much worse, for example, in a patient with persistent AFib and structural heart disease. Moreover, many patients need more than one procedure. He did agree with his counterpart in that a better understanding of anatomy and pathophysiology is needed for better outcomes, and that the available imaging equipment is already very good.

### **Callout quote: 'We need much more' Sébastien Knecht**

Additional technological improvements could, however, improve the efficacy of ablation, such as contact force sensing for a more reproducible procedure. In persistent AFib, the role of CFAE ablation remains unclear,

while the creation of linear lesions is a clear endpoint. Ablation at additional sites, with the objective of improving outcomes, is time-consuming and requires a lot of burning. Additionally, complication rates are high: citing the latest worldwide survey, major complications are seen in 4.5% of patients, and death in 0.15%. Therefore, 1 in 600 patients undergoing catheter ablation die from the procedure, which is unacceptable. As previously mentioned, better understanding of the pathophysiology and anatomy is needed, and the operator should always be alert to unexpected changes.

The discussion centred around recurrence rates: Prof. Kuck commented that there is a continuous increase in recurrence even 5 years after catheter ablation for AFib. Hein Wellens responded by saying that 'What we're doing in most cases is postponing recurrences – cure is very rare'.

### What the next generation of electrophysiologists has to say

Giuseppe Augello (Milan, Italy) works with Carlo Pappone, and he remarked that while a big lab can have several advantages, such as learning standards, the presence of such a standard also means that there is less opportunity for research and less possibility to treat other arrhythmias. In his opinion, AFib ablation now has a common rationale, and there is universal agreement that catheter ablation is better than AADs for AFib. Tom De Potter (Aalst, Belgium) trained with Karl-Heinz Kuck and presented his thoughts on the current status and future directions for AFib ablation. He cited several potential approaches for improvement which included pre-procedural patient selection, and if the 'right patients are chosen then good results are possible'. An ideal patient would be young, with paroxysmal AFib, in good physical condition and highly symptomatic. While acknowledging that most patients don't meet these criteria, he still believes that better patient selection

could improve outcomes by identifying 'PVI non-responders'. Daniel Scherr (Bordeaux, France) is in the laboratory of Michel Haïssaguerre, and first reminded the participants to 'First do no harm'. This is important as there is a need to reduce the complication rates associated with catheter ablation of AFib. Pre- and intra-procedural management should focus on adequate anticoagulation. Energy delivery should also be limited. He showed the results of a preliminary study in which patients on peri-procedural warfarin may have fewer complications compared to those undergoing bridging with heparin. In terms of post-procedural anticoagulation, warfarin should be continued for at least 2 months, and should never be stopped in a high risk population.

### Future directions in AFib ablation

In the closing session, Carlo Pappone (Cotignola, Italy) started off by saying that the AFib population is complex, and as a consequence electrophysiologists should begin to move beyond paroxysmal AFib, and seriously address questions about whether patients with structural heart disease, for example, are suitable candidates for ablation procedures. Treatment of these types of patient populations is a challenge for the future.

### Callout quote: 'We should think big' Carlo Pappone

In 'thinking big', he presented what he believes the future EP lab should look like, which must address hybrid ablation approaches as well as remote accessibility and navigation systems. It must be simplified, rational and provide increased communication. Wireless instrumentation and catheters would be one step in the right direction, re-

ducing both cabling time and issues. While saying that pre-shaped catheters such as balloon catheters are ‘not for everybody’, newer flexible-tip catheters with ballpoint or brush tips may provide several advantages. Additionally, improvements in real-time lesion assessment, robotics and contact force sensing will likely provide additional benefits for both patients and operators. He concluded by saying that we need better understanding of the pathophysiology of AFib, and to achieve this ‘the future is to become cardio-arrhythmologists again’.

Karl-Heinz Kuck (Hamburg, Germany) closed the session by asking several provocative questions such as whether AFib and/or its chronic forms can be prevented by (early) catheter ablation. He also noted that there is still room for improvement of success rates after ablation, and that many patients have recurrences even in the long term. One open challenge is to achieve permanent isolation of permanent AFib after just one procedure, and in this context contact force-sensing and visually-guided ablation with direct visualisation may be the ‘next big steps’. In terms of preventing/postponing the conversion to permanent AFib, he mentioned an ongoing trial that is studying the benefits of early intervention in paroxysmal AFib.

## About the 9<sup>th</sup> Atrial Fibrillation Symposium

At the end of March 2010, the „9<sup>th</sup> Atrial Fibrillation Symposium“ focused on the efficient treatment of Atrial Fibrillation by using minimally-invasive catheter ablation. The Catheter Ablation therapy, secondary line treatment, can help lead to a significant overall improvement, as well as to a complete cure of the illness. According to recently published figures by the Journal of the American Medical Association (JAMA), patients who undergo a catheter ablation show significantly less Atrial Fibrillation symptoms and enjoy a considerably enhanced quality of life at 3 months.<sup>4</sup>

About 500 international participants took part in the scientific dialogue at the Symposium and discussed the most recent findings on catheter ablation. Over the past years, 35,000 individuals across Europe have undergone this treatment to enhance their quality of life significantly.

Atrial Fibrillation is not always diagnosed as an illness in time as physicians’ knowledge to detect the illness and its consequences are limited or missing. Shortness of breath, dizziness, chest pains, chronic fatigue and a constantly low energy level are often dismissed as stress factors. However, atrial fibrillation can be treated and accordingly strokes can be prevented.

Therapeutic possibilities of Atrial Fibrillation are improving constantly. The Symposium regularly addresses the most recent developments, trends and techniques on the subject of AFib treatments, and notably on catheter ablation. It offers a platform for discussion where leading experts can talk amongst themselves or with young scientists.

Over the past years, the event has become an essential base for the continuing development of catheter-ablation as a treatment form of Atrial Fibrillation. The Symposium is

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4 David J. Wilber; Carlo Pappone; Petr Neuzil; et al.: Comparison of Antiarrhythmic Drug Therapy and Radiofrequency Catheter Ablation in Patients With Paroxysmal Atrial Fibrillation: A Randomized Controlled trial. JAMA 2010;303(4):333-340).

made possible through an educational grant by Biosense Webster, a leading company in the area of AFib diagnostic and treatment technology.

### **About Biosense Webster, Inc.**

Biosense Webster, Inc., a Johnson & Johnson company, pioneered electrophysiology diagnostic catheters more than 30 years ago and

continues to lead the industry as an innovative provider of advanced diagnostic, therapeutic and mapping tools. As the leader in navigation systems and ablation therapy, Biosense Webster, Inc.'s technology includes the largest installed base of navigation systems worldwide in leading hospitals and teaching institutions. With proprietary products the company is changing the way electrophysiologists diagnose and treat arrhythmias.